

REMARKS/ARGUMENTS

Claims 1-8 and 11-26 are pending. Claims 9 and 10 are canceled. Claims 1-8 and 11-26 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Lee* and *Kaibel* in view of *Brocker*.

Applicants thank Examiner Witherspoon for the courtesy of an interview extended to Applicants' representatives on August 10, 2007. During the interview, all of Applicants' claims were discussed and Examiner Witherspoon reacted favorably to Applicants' arguments pointing out the unexpected results of Applicants' process. Arguments similar to those discussed during the interview are reiterated below.

Lee teaches the preparation of hexahydropseudoionone (equivalent to tetrahydrogeranylacetone, herein after referred to as THGAC) from pseudoionone wherein selective hydrogenation of multiple C-C double bonds is achieved while maintaining the C-O double bond of the carbonyl group (pg 1, left column, lines 37-44). *Lee*'s process results in 84% yield (981g/1173g) of THGAC in approximately two hours (pg 1, right column, lines 30-52).

Kaibel teaches hydrogenation of a single triple C-C bond to a double C-C bond, and further to a single C-C bond while maintaining the C-O double bond of the carbonyl group (column 4, lines 59-64). *Kaibel* also teaches a reactor for carrying out such reactions (abstract). However, *Kaibel* only discloses achievement of higher space-time yields with the reactor (i.e. acceleration of the reaction) (column 1, lines 49-52 and column 2, lines 23-27). More specifically, *Kaibel*'s comparative experiments show that reaction times were decreased from 11 hours and 7 hours to 4 hours (column 5, lines 23-44). Lastly, *Kaibel* never mentions product yield improvement.

Brocker teaches hydrogenation of a single C-C double bond while maintaining the C-O double bond of the carbonyl group (column 1, lines 5-26). *Brocker* also teaches a reactor, similar to *Kaibel*, for carrying out such reactions (abstract). Likewise, *Brocker* achieves

reaction acceleration from 19 hours to 2.75 hours (column 5, lines 8-26). However, *Brocker* makes clear that despite increased reaction time, only negligible product yield improvement was seen (i.e. from 92.9% to 94%) (column 5, lines 8-26). Such a negligible yield improvement seems to correspond with *Kaibel's* lack of disclosure of yield improvement.

In sum, *Lee* teaches the process of making THGAC from pseudoionone with 84% yield, *Kaibel* teaches a device for similar reactions that increases reaction time with no mention of beneficial yield results, and *Brocker* teaches a similar device for similar reactions that increases reaction time with only negligible yield improvement. Accordingly, the combination of *Lee*, *Kaibel* and *Brocker* fails to teach or suggest a process for making THGAC with significantly improved yield in conformity with Applicants' specific preparation.

The present specification shows that Applicants' claimed preparation provides a yield of more than 96% of THGAC (Examples 1 and 2). This yield improvement was an unexpected result since the expectation of combining *Lee's* process of making THGAC with *Kaibel* and *Brocker's* reaction device would be *Lee's* product with 83-85% yield and a faster reaction time.

Evidence of unexpected properties may be in the form of a direct or indirect comparison of the claimed invention with the closest prior art which is commensurate in scope with the claims, and such indirect comparison can be sufficient to rebut a prima facie case of obviousness (M.P.E.P. 716.02(b), Part III). Applicants' specification does not provide direct comparative data with *Lee* but does provide enough data that an indirect comparison can be made between the two. *Lee's* reaction conditions provide for a palladinized carbon catalyst, hydrogen pressures ranging from 500 to 1250 lbs, and a temperature around 90°C (see Example 1). Applicants' reaction conditions provide for a palladium-carbon suspension catalyst, hydrogen pressure of 10 bar, and a temperature of 60

°C or 100°C (see Example 1 and 2). Therefore, with such similar reaction conditions, a similar yield would be expected and an increase of 12% yield (from 84% to 96%) would be quite unexpected.

Furthermore, pseudoionone contains three sites of unsaturation each having different reactivities and therefore different rates of hydrogenation. Accordingly, variation of a reaction condition such as reaction time may result in different effects on each of the sites and may effect the selectivity of each of the sites. As a result, it would be expected that a faster reaction time may yield a higher proportion of incompletely hydrogenated products. Thus, a significant increase in yield, as Applicants' process provides, would be quite unexpected.

For the reasons discussed above, Applicants submit that all now-pending claims are in condition for allowance. Applicants respectfully request the withdrawal of the rejections and passage of this case to issue.

Respectfully submitted,

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